## Claims

1. A method for determining the depth of anesthesia wherein at least one anesthetic agent is administered into a patient's bloodstream during the delivery of anesthesia, comprising:

sampling a patient's expired breath;

analyzing the breath for concentration of at least one substance indicative of the anesthetic agent using sensor technology; and

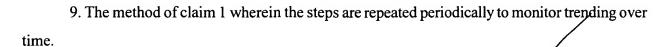
determining depth of anesthesia base on the concentration.

 $\frac{600}{400}$  2. The method of claim 1 wherein the breath is analyzed after a predetermined period of time.

- 3. The method of claim 1 further comprising the step of using a flow sensor to detect starting and completion of exhalation during said sampling step.
- 4. The method of claim 1 further comprising the step of controlling an infusion pump for delivering the agent intravenously based on the depth of anesthesia determined.
- 5. The method of claim 1 wherein the agent is delivered by a delivery method selected from the group comprising: intravenous delivery, parenteral delivery, sublingual delivery, transdermal delivery, and *i.v.* bolus delivery.
  - 6. The method of claim 1 wherein the agent is delivered by continuous infusion.
  - 7. The method of claim 1/wherein the agent is delivered by an infusion pump.
- 8. The method of claim 1 wherein the agent is selected from the group comprising Remifentanil and Propofol.

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- 10. The method of claim 1 wherein the agent is for amnesia.
- 11. The method of claim 1 wherein the agent is for analgesia.
- 12. The method of claim 1 wherein the agent is for muscle relaxation.
- 13. The method of claim 1 wherein the agent is for sedation.
- 14. The method of claim 1 wherein a combination of agents is administered.
- 15. The method of claim 1 wherein the concentration is measured to determine anesthetic blood concentration.
- 16. The method of claim 1 wherein the concentration is measured to determine analgesic blood concentration.
- 17. The method of claim 1/wherein the concentration is measured for a level indicative of recovery.
  - 18. The method of class 1 wherein the sampling is continuous.
  - 19. The method of claim 1 wherein the sampling is periodic.
- 20. The method of claim 1 wherein the patient's breath is analyzed by sensor technology selected from semiconductor gas sensor technology, conductive polymer gas sensor technology, or surface acoustic wave gas sensor technology.

- 21. The method of claim 20 wherein the sensor technology produces a unique electronic fingerprint to characterize the concentration of said at least one substance.
- 22. The method of claim 1 further comprising the step of recording data resulting from analysis of the patient's breath.
- 23. The method of claim 1 further comprising the step of transmitting data resulting from analysis of the patient's breath.
- 24. The method of claim 1 wherein the analysis of the patient's breath includes comparing the substance sensed in the patient's breath with a predetermined signature profile.
- 25. The method of claim 1 further comprising the step of capturing the patient's breath in a vessel prior to analysis.
- 26. The method of claim 1 further comprising the step of dehumidifying the patient's breath prior to analyzing.
- 27. The method of claim 1 wherein said analysis further includes detecting exhalation of the patient's breath with a sensor.
- 28. The method of claim 1 wherein said substance indicative of the anesthetic agent is free anesthetic agent.
- 29. The/method of claim 1 wherein said substance indicative of the anesthetic agent is metabolites of the anesthetic agent.

- 30. The method of claim 1 wherein said substance indicative of the anesthetic agent/is free anesthetic agent and metabolites of the anesthetic agent.
- 31. The method of claim 1 further comprising the step of assigning a numerical value to the concentration as analyzed upon reaching a level of anesthetic effect in said patient and, thereafter, assigning higher or lower values to the concentration based on its relative changes.
- 32. The method of claim 31 further comprising monitoring the concentration by monitoring changes in said value and adjusting administration of anesthesia to maintain a desired anesthetic effect.
- 33. A method for monitoring endogenous compounds in a patient, comprising: sampling a patient's expired breath; analyzing the breath for concentration of endogenous compounds using sensor technology; and calculating the concentration of endogenous compounds.
- 34. The method of claim 33 wherein the endogenous compounds are selected from glucose, ketones, or electrolytes.
- 35. An anesthetic agent delivery system for delivering a desired dose of anesthetic agent to a patient comprising:

an anesthetic supply having a controller for controlling the amount of anesthetic agent provided by the supply;

a breath analyzer for analyzing the patient's breath for concentration of at least one substance indicative of the anesthetic agent concentration in the patient's bloodstream that provides a signal to indicate the anesthetic agent concentration delivered to the patient; and

a system controller connected to the anesthetic supply which receives the signal and controls the amount of anesthetic agent based on the signal.

- 36. The system of claim 35 wherein the breath analyzer comprises a collector for sampling the patient's expired breath, a sensor for analyzing the breath for concentration of at least one substance indicative of the anesthetic agent concentration, a processor for calculating the effect of the agent based on the concentration and determining depth of anesthesia.
- 37. The system of claim 36 wherein the sensor is selected from semiconductor gas sensor technology, conductive polymer gas sensor technology, or surface acoustic wave gas sensor technology.
  - 38. An apparatus for administering intravenous anesthesia to a patient comprising: at least one supply of at least one intravenous anesthesia agent;

intravenous delivery means for controllably intravenously delivering said at least one intravenous anesthesia agent to the patent;

a breath analyzer for analyzing the patient's breath for concentration of at least one substance indicative of the anesthetic agent in the patient's bloodstream that provides a signal to indicate the anesthetic agent concentration delivered to the patient; and

a system controller connected to the intravenous delivery means which receives the signal and controls the amount of anesthetic agent based on the signal.

- 39. A method for monitoring perflubron levels in an anemic patient, comprising:
- (i) sampling a patient's breath;
- (ii) analyzing the breath for concentration of perflubron using sensor technology; and
- (iii) calculating the blood concentration of perflubron based on the concentration.

